

Application Serial No. 10/501,043
Reply to Office Action of November 27, 3006

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Docket: CU-3831 RJS**Amendments To The Claims**

The listing of claims presented below will replace all prior versions, and listings, of claims in the application.

Listing of claims:

Claims 1-58. (Cancelled)

Claims 59-114 (Cancelled)

115. (New) An infrastructure system for telecommunication comprising:

signal medium with inconsistent properties using two way or one way telecommunication platform which cannot sustain sufficient connectivity and bandwidth with said signal medium applied, in that said infrastructure system is conditioned using transponders, including repeater, coupler arrangements and necessary carrier frequency converters and signal level adaptations, where said conditioning of said infrastructure system including said signal medium is comprehensive and global and facilitates sustainable connectivity and bandwidth in that stable and consistent frequency band limited transfer properties and noise properties that are comparable to coaxial or twisted pair systems, are available at transponder interfaces of said infrastructure system, thus enabling any of a D/A and an A/D physical layer (PHY) of said telecommunication platform to be connected to or included in said transponder interfaces.

116. (New) An infrastructure system according to claim 115, wherein said one or more interfaces is connected with a cable modem communication platform PHY having essentially similar characteristics to a transmission line.

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117. (New) An infrastructure system according to claim 115, wherein said one or more interfaces are attached to provide any one or more different arrangements to enable transmission line-like performance where the arrangements depend on the different signal path anomalies to be compensated while signal dynamic balance is controlled to preserve signal-to-noise ratio and large signal handling.

118. (New) An infrastructure system according to claim 115, wherein said one or more interfaces are active, powered devices at most physical points in between distance paths to facilitate the conditioning of the medium towards performing like a transmission line-based system.

119. (New) An infrastructure system according to claim 115, wherein said one or more interfaces are active, powered devices inserted at physical points on distance paths to facilitate the conditioning of the medium towards performing like a transmission line-based system.

120. (New) An infrastructure system according to claim 115, wherein said one or more interfaces are active devices being accessed through analog interfaces as when said analog interface is comprised of a telecommunication PHY.

121. (New) An infrastructure system according to claim 115, wherein said apparatus uses a super regenerative or an analogous, switched regenerative amplifier at a suitable intermediate frequency through bi-directional filtering and bi-directional super heterodyne mixing when necessary for same or different frequency band amplification.

122. (New) An infrastructure system according to claim 115, wherein said apparatus uses a super regenerative or analogous, switched regenerative amplifier at an intermediate frequency when necessary for same or different frequency band

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amplification, and is connected to the medium through separated ports through one or more frequency mixers and through individual input and output amplifiers and filters, and is connected to the medium as a one port to as a multi port to utilize existing attenuation as port isolation at high frequencies.

123. (New) An infrastructure system according to claim 115, wherein said apparatus uses a super regenerative or analogous, switched regenerative amplifier at a high intermediate frequency through bi-directional filtering and bi-directional super heterodyne mixing when necessary for same frequency band or shifted frequency band amplification to allow very high bandwidths.

124. (New) An infrastructure system according to claim 115, wherein said apparatus uses super regenerative amplification at a high intermediate frequency and is connected to the medium through separated ports through one or more frequency mixers and through individual input and output amplifiers when necessary for same frequency band or shifted frequency band amplification.

125. (New) An infrastructure system according to claim 115, wherein said apparatus uses super heterodyne amplification at an intermediate frequency through at least two frequency mixers and frequency filtering connected to the medium through separated ports to utilize existing port isolation and attain stability when necessary for same frequency band amplification.

126. (New) An infrastructure system according to any one of claims 115, 121, 122, 123, 124, 125 wherein said apparatus uses active devices meeting requirements for frequency, phase and amplitude linearity of commonly used modulation types and time and frequency division multiplexed systems.

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127. (New) An infrastructure system according to claim 115, aimed to sustain information bandwidth.
128. (New) An infrastructure system according to claim 115, arranged to facilitate the use of substantially higher frequency bands and carrier frequencies than the medium would otherwise allow.
129. (New) An infrastructure system according to claim 115, arranged to accommodate a plurality of modulation types, including modulation types requiring high linearity.
130. (New) An infrastructure system according to claim 115, compatible with modulation types which include one or more of at least the modulation types QPSK, QAM, OFDM, CDMA and DSSS.
131. (New) An infrastructure system according to claim 130, compatible with a plurality of telecommunication standards platforms physical layer PHY which include one or more of the standards Ethernet, DOCSIS, EURODOCSIS, 802.11x, Wimax, GSM, as well as being compatible with any proprietary telecommunications platform physical layer PHY.
132. (New) An infrastructure system according to claim 115, is adaptable through up and down frequency conversions between the infrastructure system interfaces and the telecommunication standard platform PHY.
133. (New) An infrastructure system according to claim 115, that utilizes inherent system attenuation from lossy cables and junction mismatches to improve the infrastructure system performance through a global presence of active and passive compensation in one or more of said apparatus.

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134. (New) An infrastructure system according to claim 115, wherein one or more of said apparatus uses inherent system attenuation properties to aid stability and noise conditions with super regenerative or super heterodyne repeaters as two port amplifiers being stable with inherent isolation.

135. (New) An infrastructure system according to claim 115 that uses power lines as the system medium or infrastructure.

136. (New) An infrastructure according to claim 115, compatible with non-standard proprietary telecommunication platforms including PHY of PLC Power Line Communication platforms.

137. (New) An Infrastructure system according to claim 115 that the system includes practically all distribution panels, fuse panels, distribution boxes, junctions, junction boxes, sub stations along the signal traveling paths as hosts and power sources for signal repeaters and coupler arrangements to facilitate the global conditioning of the grid into a transmission line similar infrastructure.

138. (New) An infrastructure system according to claim 115 that includes the use of any conductors of any of ground buried cables, air mounted cables and bare wires in differential mode using at least two conductors as pair.

139. (New) An infrastructure system according to claim 115 that includes the use of air mounted conductors of any of power grid cables and medium voltage cables and wires and high voltage cables and wires where wires work in Lecher or waveguide mode using very high carrier frequencies.

140. (New) An infrastructure system according to claim 115 that includes the use of any of high voltage distribution and medium voltage grid and street light and control grid

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and low voltage grid.

141. (New) An infrastructure system according to claim 115 that uses active, powered devices in all or most junction points in the power grid to facilitate the conditioning of the grid towards performing like a transmission line based system.

142. (New) An infrastructure system according to claim 115 that uses inherent attenuation in cable or wire junctions to form multi-ports with mutual isolation to aid stability and noise conditions with super regenerative as well as super heterodyne repeaters.

143. (New) An infrastructure system according to claim 115 that uses a coupler to a high or medium voltage, arranged as a magnetic loop antenna providing a galvanic isolated differential coupling to at least two conductors of the high or medium voltage.

144. (New) An infrastructure system according to claim 115 that uses a coupler to a high or medium voltage, arranged using the shield of the high or medium voltage cable as a capacitive coupler, using grounding toroid ferrite clamp improvement on the shield grounding wire and advantageously a ferrite toroid improvement outside the shield at a short distance from the shield grounding wire, and where the two signal connection points are at opposite sides of said grounding toroid on the shield ground wire or through a winding on one or both of the ferrites.

145. (New) An infrastructure system according to claim 144 that uses two such coupler arrangements on two cables to provide differential signal coupling and thus enabling improved signal power transfer and signal dynamics, reduced emissions and improved immunity.

146. (New) An infrastructure system according to claim 115 that uses a capacitive

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voltage measurement probe of an Elastimold or similar shielded cable assembly for a high or medium voltage system, for signal coupling.

147. (New) An infrastructure system according to claim 146 that uses two such probe arrangements to provide differential signal coupling and thus enabling improved signal power transfer and signal dynamics, reduced emissions and improved immunity with Elastimold or similar shielded cable assemblies.

148. (New) An infrastructure system according to claim 147 that uses a matching device to avoid losses due to the high impedance and low capacitance of the capacitive high voltage measurement probe in Elastimold or similar high or medium voltage assemblies.

149. (New) An infrastructure system according to claim 115 that uses fibre coax HFC similar arrangements to obtain accessing of the infrastructure system at shorter intervals and binding together the infrastructure system, thereby enabling reductions of necessary communication distances and necessary gain cascades lengths on the low voltage power grid.

150. (New) An infrastructure system according to claim 115 that uses any of high voltage and medium voltage power lines to complement hybrid fibre coax HFC similar arrangements and to reduce the number of HFC similar nodes.

151. (New) An infrastructure system according to claim 115 arranged to accept D/A and A/D PHY master or headend equipment to be installed at any point to any locations in the infrastructure system and thereby providing flexible topology solutions.

152. (New) An infrastructure system according to claim 115, wherein said apparatus includes repeaters or transponders for customer premises equipment installed at or

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prior to a customer fuse panel, thus reducing emissions and improving immunity.

153. (New) An infrastructure system according to claim 115, wherein said apparatus is an arrangement in distribution panels or distribution boxes or fuse panels or fuse boxes using repeaters or transponders to link signals between coupler on ingoing supply cable with couplers on outgoing cables to reduce effects from inherent losses, reflections and mismatches and to utilize inherent attenuation in the distribution or junction system to provide isolation between in port and out ports and between out ports.

154. (New) An infrastructure system according to claim 115, wherein said apparatus includes substations linked together on medium voltage power lines to serve a purpose similar to an analog fibre link.

155. (New) An infrastructure system according to claim 115, wherein any of transformers and sub stations among the apparatus are adapted for facilitating routing of signals between a high voltage side and a medium voltage side through couplers and at least one of transponders, repeaters, cables, coaxial cables, fibre optic cables.

156. (New) An infrastructure system according to claim 115, wherein any of transformers and sub stations being part of the apparatus are equipped to facilitate routing of signals between a medium voltage side and a low voltage side through couplers and at least one of transponders, repeaters, cables, coaxial cables, fibre optic cables.

157. (New) An infrastructure system according to claim 115, wherein said apparatus embodiment can facilitate routing of signals between a high voltage side of a transformer and a low voltage side of the transformer by utilizing the transformer equivalent high frequency circuit properties to form a high frequency network for signals

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to pass through the transformer, by utilizing the high stray capacitance coupling between transformer sections using any of one phase rail and three phase rail and ground terminal and neutral terminal of the transformer in connection with external coupler and reactance.

158. (New) An infrastructure system according to claim 115, wherein said apparatus includes a wireless system node at any point in the system with an antenna and interfaced with a repeater or repeating transponder as a node of the infrastructure system.

159. (New) An infrastructure system according to claim 158, wherein said node of the infrastructure system is an output node.

160. (New) An infrastructure system according to claim 158, wherein said node of the infrastructure system is an input node.

161. (New) An infrastructure system according to claim 115, adapted for frequency shifting in any power line junction point to adapt to varying power cable characteristics.

162. (New) An infrastructure system according to claim 115, that enables physical penetration of cables in long cable runs to insert repeaters or repeating transponders with galvanic or non-galvanic couplers to compensate for signal losses.

163. (New) An infrastructure system according to claim 115, wherein said apparatus is arranged to improve immunity properties at various physical positions using active cancellation of common mode noise from any of near field sources and far field sources by using reference sampling antennas or reference sampling probes for the common mode energy which aids identifying, characterizing and canceling common mode interference.

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164. (New) An infrastructure system according to claim 115, wherein said apparatus is arranged to accept any suitable number of any of A/D and D/A cost saving headend equipment to be supplementary installed in any locations in the infrastructure system.

165. (New) An infrastructure system according to claim 115, wherein said apparatus is arranged to incorporate medium voltage non-galvanic high frequency interfacing by using a pair of fibre optic connections to a pair of repeaters or transponders advantageously optically powered and galvanically or non-galvanically installed separately with mutual galvanic isolation on at least two medium voltage conductors to provide differential, low emission and high immunity interface to medium voltage power lines as well as high voltage power lines.

166. (New) An infrastructure system according to claim 115, wherein said apparatus is arranged to incorporate medium voltage to low voltage transitions through coaxial cables.

167. (New) An infrastructure system according to claim 115, wherein said apparatus is adapted to incorporate repeater nodes that have built in intelligence in the form of microprocessor or state machine for any of control tasks and sensor tasks and activator tasks

168. (New) An infrastructure system according to claim 167, wherein said apparatus is adapted to incorporate repeater nodes that interface remotely interrogated sensors.

169. (New) An infrastructure system according to claim 115, wherein said apparatus allows a snumber of master units installed at different locations in the infrastructure.

170. (New) An infrastructure system according to claim 115, that it is a two-way system utilizing separate repeating transponder or repeater functions in separate

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frequency bands in order to achieve an infrastructure system for more than one signal
transmission direction.